JPRS 75839

9 June 1980

Japan Report

No. 99

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POLITICAL AND SOCIOLOGICAL

DEFENSE POLICY COMPROMISE DISCUSSED

Tokyo KEIZAI TENBO in Japanese 1 Apr 80 p 18

[Text] "Small differences remain, but there is considerable agreement." Those are the famous words of China's late Premier Zhou Enlai, spoken at the juncture of the normalization of Sino-Japanese relations. "Although there are many questions, such as that of territory, which have to be resolved between Japan and China, if we dwell on these fine points a normalization of relations is impossible. So now we'll postpone these for the time being and give the highest priority to normalizing diplomatic relations." From this, a solution was reached.

These historic words have been revived, and are being touted as a kind of Golden Rule by opposition parties, especially the Japan Socialist Party, Komeito, and the Democratic Socialist Party, which are being rumored for a coalition government. This can be seen in policy management as the question "Why not put small policy differences aside for the moment for the sake of the overall goal of achieving a coalition government?" Defense policy is a typical example of that.

The Democratic Socialists have all along been the ones showing the most comprehensible stance regarding defense policy, at any rate their existence per se accords with their flight from the Socialist Party over the interpretation of the revision of the U.S.-Japan security treaty, and for some time they have been working out an acceptable direction, minor restrictions aside, with regard to the security treaty and the Self-Defense Forces.

The Komeito, which last year was grappling with the concept of a middle-of-the-road government with the DSP, have so far been unable to hammer out a more clear-cut stance than that of vacillating between moving left then turning around and making a course correction to the right, and as for the aforementioned concept of government, they have finally ventured to support the Self-Defense Forces and continue the security treaty.

Even though the Komeito can still not bring themselves to abandon such basic policies on abrogation of the security treaty and reorganization of the Self-Defense Forces, stating "strive for an international climate where abrogating the security treaty is possible," and "leave some leeway to study the pros and cons of revamping the Self-Defense Forces," they are taking, at any rate, a position conducive to general agreement and a middle-of-the-road government.

Small Differences Will Ignite Sooner or Later

As for the Komeito, such a turnabout is startling enough in the hardline party that in 1973 espoused (at times) the theory of abrogating the security treaty immediately, but a similar change can even be seen in the JSP, which is even farther to the left than the Komeito.

Of course, that there are plans for a coalition with the Komeito, without taking as clear a stand as the Komeito, is seen in the deliberate avoidance of the question and in the tacit acceptance of the status quo, taking at face value the fundamental policy of abolishing the security treaty and reducing the Self-Defense Forces.

The thing that demonstrated this more bluntly than anything else was the budget revision at the last Diet sessions. The one stumbling block to the motion to revise the budget, which was a joint effort by the JSP, Komeito, and Democratic Socialists, was the JSP's request to pare defense spending. Although the JSP withdrew this and things went along without a hitch, such a change in position is hardly something we could not recognize.

"That's how realistic the policies of the opposition have become." That is how ecstatic some political commentators seem at that fact, yet on the other hand there are those who are deeply worried about the future, saying "This does not mean the small differences have been put aside, and they might be fanned into flames when the coalition government is actually formed." That evaluation is about as clear as we can get.

CSO: 4105

MILITARY

SOVIET ARMY HEADQUARTERS PREDICTED ON ETOROFU ISLAND

Tokyo KYODO in English 4 May 80 OW

[Text] Tokyo, 4 May (KYODO)--Government sources revealed Sunday that the Soviet Union was continuing to beef up its military forces on the four islands off Eastern Hokkaido claimed by Japan and that an army division headquarters have been set up on Etorofu Island, one of the four islands.

They believe the establishment of the division headquarters in Tennei on Etorofu Island further made clear the Soviet intention to use the islands--Etorofu, Kunashiri, Shikotan and Habonai--as permanent military bases.

They also fear that Soviet military activities centered on the four northern islands will be stepped up in and after May when the Sea of Okhotsk becomes ice free.

After the army corps of about 15,000 men was withdrawn from Kunashiri and Etorofu Islands in 1960, the Soviet Union had stationed only border patrol units on the islands.

The sources said, however, the Soviet Union again stationed ground troops on the two islands from around the summer of 1978 and started building bases.

They said the Soviet Union also started to build military facilities on Shikotan Island last summer. They believed the military forces on the island were reinforced, although on a small scale, from last yearend even during the icebound period.

They said the strength of the military forces stationed in the northern territories is believed to be approaching close to the division level of about 13,000 men and that it now numbers some 10,000 men.

The sources said the possibility is strong that the strength will be increased to the division level by the end of this year.

The possibility of the existence of a division headquarters on Etorofu Island had been pointed out since last summer.

The sources said this was confirmed around February. This means that the Soviet units stationed on the northern territories are connected directly with the Far East Army Regional Headquarters in Khabarovsk.

They said the Soviet Units stationed on the islands possess virtually all the equipment normally used by a division, including tanks, antiaircraft guns and ground-to-air missiles.

They also believed 130mm cannon guns, assault helicopters (MI-24) usually possessed by units above the division class are located on Kunashiri and Etorofu Islands.

The sources believe the MIG 17 fighters stationed on the islands eventually will be replaced by the MIG 219 and MIG 236.

The defense agency had believed at first that the Soviet forces on the northern islands were for defensive purposes to defend the islands.

After it was made clear that assault helicopters are being stationed and that military facilities also have been built on Shikotan Island. The agency officials said it could not be said clearly whether the military forces on the islands are of offensive or defensive in nature.

They still believe, however, that the military build-up of the islands is aimed chiefly at checking Sino-Japanese friendly relations following the conclusion of the Japan-China friendship treaty and at strengthening the Soviet effective control of the islands, or possessed more of a political coloring than a military meaning.

CSO: 4120

MILITARY

BUILD-UP OF AIR, NAVAL POWER EMPHASIZED IN FY '81

Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 pp 4-6

[Text]

Kichizo Hosoda, State Minister for Defense, has given the Chairman of the Joint Staff Council, Chiefs of the Ground, Maritime and Air Staff official instruction on drafting FY 1981 operations plans for the three services. The instruction stipulates; 1) increased construction of naval vessels for antisubmarine operations; 2) modernization of the BADGE air defense system; 3) selection of a new military transport aircraft (C-X) to supplement and/or replace the Kawasaki C-1; 4) a joint military exercise of the Japanese Ground Self-Defense Force (GSDF) and the US Army for the first time; and 5) purchase of four additional Grumman E-2C early warning aircraft.

Hosoda's instruction and accompanying explanatory comments by the Japanese Defense Agency (JDA) follow:

The Ground, Maritime and Air Self-Defense Forces will draft their respective FY '81 operations plans, taking into consideration issues related to modification of the FY '80-'84 Medium-Term Defense Program now being promoted by the JDA. Special consideration will be given to the following.

1. Rationalization of defense procurement and operations. --- 1) Reassignment of more personnel to front-line units by simplifying structures of command headquarters; 2) modernization and rehabilitation of warships and aircraft in order to extend their service life; 3) utilization of such retiring weapons as the Vulcan machine gun system of the ASDF/Lockheed F-104J for base air defense and other missions; and 4) cost-saving and rationalization in education, training and exercise.

2. Active promotion of the large-scale programs now under way. --- 1) Replacement of old type Hawk missiles with Improved Hawks at the GSDF Matsudo unit, Chiba Prefecture;

2) training of flight, maintenance crew and instructors in preparation for introduction of P-3C antisubmarine patrol aircraft in FY '81; 3) training ASDF/McDonnell Douglas F-15 pilots in the United States and procurement of ground support equipment; 4) procurement of four more E-2C early warning aircraft and training of flight crews in the US; 5) studies on a buffer system to link E-2Cs with the BADGE system; and 6) expansion of support facilities at Iwo Jima.

3. Studies and exercises related to defense operations and establishment of a system to efficiently command and control the three services. --- 1) Completion of current studies related to defense operations by the end of March 1981; 2) continued studies on basic policies on Japan-US defense cooperation, and legislation and regulations for emergency cases; 3) a combined exercise of the three services under the command of the Chairman of Joint Staff Council; and 4) joint exercises with American forces, including a joint GSDF/US Army exercise, participation of the MSDF in the next RIMPAC and monthly air combat exercises by ASDF with USAF.

4. Establishment of a central headquarters based on data to be submitted by JDA's preparatory committee. --- Construction is scheduled to begin in FY '81 and be completed in FY '83.

5. Stockpiling of ammunition. --- 1) Stockpiling of 2,000 tons of ammunition by the GSDF per year in preparation for emergencies; and 2) upgrading MSDF facilities in order to keep half of its mines and torpedos ready for service at all times.

6. Improvement of defense powers at military bases and facilities. --- 1) Installation of antiair machine guns and missiles at air bases and important communications and supply depots; 2) procurement of metal-mat material to quickly repair damaged runways and reinforcement of mobile communications and air warning units in order to meet emergency requirements.

7. Improvement of GSDF weapons. --- Procurement of 203mm self-propelled artillery and Tan-SAM and other antiair weapons.

8. Modernization and improvement of antisubmarine naval equipment. --- Efforts will be made to obtain funds in FY '81 for 7,000 tons of warships, which were not approved this fiscal year.

9. Modernization of the BADGE system and improvement of military air transport capabilities. --- 1) Construction of a new system to replace the present BADGE in FY '82, aimed at completion in FY '85; and 2) selection of a longer-range military transport (C-X) to supplement and/or replace present C-1 aircraft.

10. Extension of retirement ages and improved welfare facilities for service personnel.

11. Increase reserve personnel. --- Annual increase of GSDF and MSDF reserve personnel and inauguration of a reserve system for the ASDF.

12. Improvement of means to protect defense secrets, based on a report submitted by JDA's Secret Preservation Study Committee.

CSO: 4120

MILITARY

NEW AND MODIFIED MSDF WARSHIPS EXPECTED UNDER MTDP

Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 pp 5, 6

[Text]

Some outstanding features of the new and modified warships expected to be procured for the MSDF under the current Medium-Term Defense Program follow:

DDG---This class of warship will adopt COGAG main powerplant of 72,000 shp, and will displace 4,200 to 4,400 tons. Armament will include the Standard/Harpoon missile system and a greater number of the close-in weapons system (CIWS). The missile control system will be also improved. Two DDGs will be procured under the same MTDP.

For one DDG to be funded in FY 1981, selection of the COGAG powerplant is under way. It is reported that choice lies between two types. One type comprises four General Electric/IHI IM2000 gasturbines each developing 18,000 shp. The other comprises two Rolls-Royce/KHI Olympus (23,000 shp) and two Spey (13,000 shp) gasturbines.

PMX---This is a new type of warship to be introduced by the MSDF, for costal defense and patrol, point defense, and antiship missions. During the 4th Defense Buildup Program (FYs 1972-76) plans were made for a 160-ton high-speed boat armed with Harpoon antiship missiles. At that time, however, the plan did not materialize due to financial problems.

The current PMX plan calls for a hydrofoil type craft. Although one PMX is planned for procurement in FY 1981, it is probable that selection of a final type may not be made in time for FY 1981 funding.

The US Navy PHM-1, a military version of the BMS commercial jetfoil, is reportedly under extensive study.

One PMX will be purchased.

Submarine---Construction of the 2,200-ton class SSS submarines will continue with various improvements. NS steel material will be used more extensively and the hull will be improved for capability to operate in deeper water. An improved main powerplant will also be adopted. KHI is developing a new MAN-type engine while MHI is developing a variant of a new non-magnetic diesel engine originally intended for use with minesweepers.

The Harpoon antiship missile system will be installed on submarines funded in FY 1980. The GRX2 highspeed homing torpedo and a new antisubmarine short torpedo will also be introduced as they become available. The inertial navigation system (INS) for new submarines is under development by the TR&DI. Funding for five units will be requested during the MTDP.

Minesweeper---Construction of the 440-ton type will continue. It is expected, however, a 480-ton type with either wooden hull or a new FRP-hull type will be introduced in or around FY 1984.

As for the main powerplant, the TR&DI has started development of non-magnetic engine. It is said to be a four-cycle in-line water-cooled engine of 1,500 hp intended to replace the current 12ZC diesel engine. Eleven minesweepers will be built during the MTDP.

In addition to the above warships, ten 2,900-ton all-gasturbine DDs and four 1,400-ton DEs with CODOG powerplants are planned for construction under the same MTDP.

CSO: 4120

MILITARY

MSDF FRAM PROGRAM MAY BE DELAYED

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 7

[Text]

The fleet rehabilitation and modernization (FRAM) program of the MSDF is likely to be delayed. The MSDF's request for funds in FY 1980 for the first ship under the FRAM program was disapproved. A second ship is scheduled for FY 1981 funding when funds for construction of a new missile-armed DDG and procurement of a high-speed missile boat are also required. It is thus expected that funds for two ships under the FRAM program will not be authorized in the FY 1981 budget.

The MSDF at present is confronted with three options. It may insist on authorization of funds for modernizing the "Takatsuki" (a DDA of 3,050 tons funded in FY 1963). Instead it may ask for funds for modernizing "Kikuzuki" (the same class DDA funded in FY 1964). Or, it will request funds for both ships. The third option will only be feasible if the Defense Agency proceeds with earlier completion of the FY '78 MTDP.

Major efforts of the FRAM program cover addition or improvement of shipboard missile systems for antiair and antiship defense.

CSO: 4120

MILITARY

MSDF TO SELECT NEW HIGH-SPEED TRAINING SUPPORT JET

Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 p 7

[Text]

The Maritime Self-Defense Force (MSDF) is going to select a new high-speed training support aircraft which it will try to have incorporated into the FY 1982 (April 1982-March 1983) budget. Under the FY 1980-84 Medium-Term Defense Program, the aircraft is designed to modernize and expand MSDF fleets' training and support setups for electronic and missile warfare along with a modified version of the P-2J.

Candidates for the high-speed training support aircraft include MHI's MU-300 and Rockwell's T-39. The MU-300 twin-engine jet is now under development as a successor to the MU-2 turboprop aircraft.

The MU-300 and other candidates will have to be considerably modified to meet mission requirements as training support aircraft. The modification cost will be a key point in the selection as the MSDF will purchase only three of the training support aircraft initially.

The MU-300 is seen as a promising candidate because of excellent support and maintenance facilities for the domestically-developed aircraft. In view of the price, including the modification cost, however, whether it can compete with foreign aircraft is uncertain.

CSO: 4120

MILITARY

NEW ARMY EQUIPMENT EXPECTED FOR FY 1981

Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 pp 8, 9

[Text]

The GSDF plans to start purchasing two new types of equipment in FY 1981 based on the FY '80-'84 MTDP. They are the M110A2 203mm self-propelled howitzer and the 66mm anti-tank grenade launcher.

The M110A2 203mm self-propelled howitzer is currently in service with the US Army. The GSDF plans to eventually procure 100 to 120 units and the funding request for FY 1981 will call for purchase of about seven units mainly for training pruposes. Subsequent orders will be made at a rate of 12 units annually during FYs 1982 through 1984. A total of 43 units thus will be obtained during the FY '80-'84 MTDP.

The GSDF is presently negotiating with the US Army and indications are that local production will be feasible under government-to-government license agreements. During the current fiscal year, the JDA will send a survey team comprising specialists from four ordnance manufacturers---MHI, Komatsu, Hitachi, and Japan Steel Works---to the US to obtain data for preparing cost estimates for local production. According to present plans, the gun barrel and the chassis will be placed in local production while the power unit (a diesel engine) will be imported from Detroit Diesel Allison Div. of General Motors Corp. It is probable, however, that initial units may be procured through the FMS (foreign military sales) system.

Among the four ordnance manufacturers, Japan Steel Works will be the first choice to manufacture the gun barrel. The prime contractor for manufacture of the chassis will be selected from the other three firms.

The 66mm antitank grenade launcher recently completed operational test and the GSDF plans to purchase 1,500 to 2,200 units during the FY '80-'84 MTDP. It will be adopted as a Model 81 standard weapon system by the GSDF.

At present the GSDF has the Model 79 SSM/L surface-to-surface missile launcher for use against tanks at medium-to long-ranges. The 106mm recoilless rifle and the Model 64 Chu-MAT/L antitank missile launcher are also in service for defense against tanks at medium-ranges. The 66mm grenade launcher will add to the short-range antitank weapons such as the 89mm rocket launcher and the 84mm recoilless rifle.

The 89mm rocket launcher is effective at 200 to 300 meters while the 66mm grenade launcher is said to have a range well over 300 meters. The 89mm RL will phase out with deployment of more 84mm recoilless rifle (range: 700 to 800 meters) and service introduction of the 66mm grenade launcher.

The GSDF plans to order about 170 units of the 66mm grenade launcher in FY 1981. Further procurement is expected to be carried out at a rate of 400 to 700 units annually.

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MILITARY

GSDF TO SEND TECHNICAL SURVEY MISSION SOON

Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 pp 7, 8

[Text]

The GSDF will send a survey mission overseas in late July to study future trends in military technology, sources report. It is expected the mission will comprise two to three specialists and study will be concentrate on air defense systems, especially on self-propelled antiaircraft guns that will be able to operate with tank forces.

In this connection, it is to be noted that the AW-X research program of the TR&DI, JDA, has entered the system integration phase for a Japanese self-propelled AA gun system. The AW-X program began in FY 1978 to meet GSDF requirements. During FY 1978, the KDA 35mm machine gun was imported and an experimental fire control system was developed. During FY 1980, these components will be integrated for installation on a modified chassis of the Model 61 tank. The AW-X prototype is scheduled to be completed in FY 1981 and undergo functional tests in early 1982. Findings of the planned survey mission therefore will be useful in deciding the final shape of the Japanese self-propelled antiaircraft gun system.

FY 1981 will be important for the GSDF for a number of other air defense systems. The GSDF plans to start purchasing the Tan-SAM Japanese short-range surface-to-air missile and a Stinger-type man-portable antiair missile. The GSDF will also decide on the replacement for the Hawk air defense missile. Four of the 8.5 GSDF Hawk units are authorized to be reequipped with an advanced SAM such as the SAM-D Patriot of the US Army under the FY '80-'84 MTDP.

CSO: 4120

MILITARY

BRIEFS

FMS SECTION ESTABLISHED--The Central Procurement Office of JDA plans to establish an office devoted to handling foreign military sales (FMS) contracts with the US government by June in order to smoothly perform increased work involving FMS contracts. The new office, which will be called Import Section II, will be staffed with 22 personnel. Specialists will be stationed in Washington and San Francisco. In FY 1979, FMS contracts totaled ¥100,000 million and increases are envisaged with progress of major military programs such as the E-2C, F-15, and P-3C involving highly sensitive equipment. The present Import Section will become Import Section I for handling import contracts on a commercial basis. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 p 4]

DRONES FOR F-15 COMBAT TRAINING--The ASDF plans to purchase three BQM-34 target drones during FY 1980 for use in aerial combat training with the ASDF/McDonnell Douglas F-15 fighter, 100 of which will be deployed in four ASDF squadrons. The first two ASDF F-15s are scheduled for delivery during FY 1980. AIM-7F Sparrow and the AIM-9L Sidewinder air-to-air missiles for the planes are to be procured during FY 1980 at a cost of about ¥6,000 million. For the F-4EJ fighter, a T-33A trainer is used for towing targets for AAM firing practice. But, AAMs for the F-15 are superior to those in use with the F-4EJ. For greater safety, the ASDF requires target drones for F-15 aerial combat training. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 p 4]

REPEATED REQUEST FOR TASS--The MSDF is expected to request funds for FY 1981 to procure the towed array sonar system (TASS). Requests were not authorized in the fiscal years of 1979 and 1980. The TASS the MSDF plans to procure is similar to the Edo SQR-18. It will be placed on MSDF ships in service to augment VDS (variable depth sonar) systems. If the funds are authorized for FY 1981, the MSDF will import the TASS system through the foreign military sales (FMS) channel. In addition to the TASS, the MSDF plans to procure some advanced equipment such as the close-in weapons system (CIWS) and shipborne missile systems in FY 1981. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 p 5]

C-130 LIKELY CHOICE AS C-X--Gen. Ryoichi Yamada, Chief of Staff, Air Self-Defense Force, told a press conference after Hosoda issued his official instruction on drafting FY 1981 operations plans for the three services that the ASDF considered the Lockheed C-130 the most likely choice as the C-X new tactical transport. Yamada told the press that the ASDF had studied such C-X candidates as the C-5, C-141/B, YC-14/15, versions of the Kawasaki C-1 and the Boeing 767 as well as the C-130 Hercules. The ASDF presently considers the Lockheed aircraft more suitable to meet Japanese requirements, he said. A final decision on the C-X's type will probably be made this summer, he added. Indications are that about 15 C-130s will be procured, starting in FY 1981. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 pp 6, 7]

CSO: 4120

ECONOMIC

'KYODO' FEATURE ON CONSUMER SPENDING

OW090544 Tokyo KYODO in English 0504 GMT 9 May 80

[Article by Hidesuke Nagashima]

[Text] Tokyo May 9 KYODO--Amid nagging worries about inflation resulting from ever-rising oil prices, it looks as though Japanese consumers are going on a shopping spree.

The nation's reatil businesses are ringing up increasing sales for practically all consumer goods--ranging from such expensive items as jewels, furs and furniture to food and daily necessities.

Japanese consumers, expecting worsening inflation following the global oil crunch last, obviously are trying to hedge against inflation by buying in advance whatever they will need in the future.

However, consumer behavior is much calmer now than in the chaotic period following the oil crisis of 1973, which precipitated the widespread panic buying of all kinds of household goods nationwide.

Japan's department store sales in the first quarter of this year jumped 10.4 per cent from a year earlier and supermarket sales rose 9.9 per cent, compared with rises in the 4-7 per cent range for both categories throughout last year.

Retail business executives seem to share the same notion about the thriving business: "It's too good to be true." They fear that the present expansion could be short-lived and be followed by a serious sales slump, after a round of inflation-hedging purchases runs out of steam.

An official of the Tokyo-based Seibu department store chain said, "We are puzzled, so to speak, by the recent sales rise." He said the chain expects business to remain active until the summer but is unsure about sales prospects beyond then.

Aside from prevailing uncertainty, luxury goods--such as yen 700,000 (dollar 3,000 mink furs--are selling fast at Tokyo's big department stores.

Business is also active for diamonds, gold accessories and other jewels at department stores, which are generally bigger and more elaborate than their counterparts elsewhere in the world and handle everything from raw fish to gold bars.

Mitsukoshi and Takashimaya department stores in downtown Tokyo report unusually active advance orders for bridal furniture--for delivery in two to six months.

Marui, a Tokyo-based department store chain specializing in installment selling, reports sales for unit furniture are up 30 per cent from a year ago.

Living room furniture also are selling at a rate 15 per cent higher than last year at major department stores.

Sales for men's suits generally are up about 20 per cent at department stores and clothing shops. Business is also thriving for food and household goods at supermarkets.

As if to prove inflation worries among the public, credit sales are increasing across the board, with consumers getting on the "buy-now, pay-later" bandwagon.

Marui's credit sales are growing at an annual rate of close to 10 per cent, compared with rises in the 5 per cent range a year ago. Seibu reports a 25-30 per cent increase in credit sales.

Past experience shows that in times of inflation, there are these three basic patterns of consumer spending:

--It slows down sharply because of inflation eroding the real income and purchasing power of consumers.

--It surges temporarily, with consumers rushing to make inflation-hedging purchases. The surge is brief and is following by a serious slump.

--It continues on a high plateau for a longer period as consumers, conscious of constant inflation and unmindful of future well-being, dip into their savings and borrow money to keep up spending.

Retail business officials are concerned about the second possibility, which would be a serious threat to the economy.

A typical "boom-or-bust" consumer spending pattern was observed in 1973-74 in the wake of the first international oil shortage.

In 1973, inflation-adjusted real consumer spending by workers' households in the nation rose 5.5 per cent, with people rushing to buy real estate, jewels, cars and other durable goods in anticipation of price hikes. Panic buying of household goods was common at supermarkets.

But in the next year, the spending fell back 2.4 per cent amid growing uncertainty about the Japanese economy. Concerned about unemployment problems, people tried to save for a rainy day while consumer prices rose 24 per cent.

Real consumer spending by workers' households has since grown at the annual rates of 1-5 per cent.

Consumers appear to have learned a lesson in the 1973-74 chaos--that they hurt themselves by panic buying--and that explains their calm behavior now.

Inflation-hedging purchases notwithstanding, today's shoppers generally are still strongly cost-conscious, and retail businesses cannot make major price hikes without risking the loss of some business.

Consumer price rises are still moderate, in the 7 per cent range and much lower than in some other Western countries. But there's no guarantee that price rises will remain in that range, considering steadily rising oil prices.

If double-digit inflation were to arrive in Japan, consumers could change their shopping pattern and begin to spend much more, without worrying about a rainy day.

Thus consumer price trends hold the key to future consumer spending in Japan.

CSO: 4120

ECONOMIC

JAPAN WHITE PAPER ON TOURISM ISSUED

OW090208 Tokyo KYODO in English 0058 GMT 9 May 80

[Excerpts] Tokyo May 9 KYODO--A total of 4,040,000 Japanese visited abroad in 1979, 15 per cent more than in the previous year, the government said Friday in its annual white paper on tourism.

The white paper was reported before the regular cabinet meeting by Director General Keizo Obuchi of the prime minister's office.

This was the first time that the number of Japanese making trips abroad has reached the 4 million level.

The white paper attributed the increase to the rise in the income level of the people and the popularity of package tours.

The white paper said, however, 72.2 per cent of the Japanese going abroad were males, indicating that they still accounted for the majority.

Whether due to this or not, Taiwan ranked at the top among places visited by the Japanese. This was followed in order by South Korea, Hong Kong and Hawaii..

As for foreigners visiting Japan, the white paper said a total of 1,100,000 came to this country, up 7 per cent from 1978.

Those from Asian countries increased 24 per cent, accounting for 43 per cent of the total.

But the number of visitors from North America, which has been showing a declining trend annually, declined 4 per cent.

As for balance of payments in respect to tourism, the white paper said Japan registered a deficit of dollar 2.5 billion, or dollar 500 million more than in 1978.

To correct the situation, the white paper stressed the importance of promoting mutual understanding with foreign countries and exerting efforts to encourage tourists from abroad.

The amount spent for domestic travels in 1979 totaled yen 4.4 trillion, down yen 200 billion from the previous year. The ratio to the gross national produce also dropped to 2.0 per cent from 2.2 per cent.

The per capita spendings dropped to yen 25,300 in terms of the 1978 value compared with yen 25,600 for the previous year.

CSO: 4120

ECONOMIC

MAJOR FY 1979 DEFENSE CONTRACTS: JDA

Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 pp 2-4

[Text]

The Japanese Defense Agency (JDA) released last week a list of major procurement contracts awarded during fiscal year 1979 (April 1979-March 1980). Orders were placed for 71 aircraft, totaling ¥116, 300 million. Mitsubishi Heavy Industrie Ltd. (MHI) led the list, having been awarded contracts for 30 aircraft in five different types, followed by Fuji Heavy Industries Ltd. (FHI) and Kawasaki Heavy Industries Ltd. (KHI). Four Grumman E-2Cs were ordered on a government-to-government basis while orders were placed for two Beechcraft TC-90s through Beech's Japanese sales representative C. Itoh Aviation Co.

A list of major FY 1979 defense contracts follows:

Unit: ¥1 million

*Aircraft

AIRCRAFT TYPE	NUMBER	AMOUNT	CONTRACTOR(AIRFRAME)	CONTRACTOR(ENGINE)
*GSDF				
OH-6s	12	18	KHI	Detroit Diesel Allison/ Shin Toa Koeki
LR-1s (MU-2s)	3	13	MHI	AiResearch Aviation
HU-1Hs	3	14	FHI	KHI
V-107A	1	10	KHI	IHI
sub total:	19	55		

AIRCRAFT TYPE	NUMBER	AMOUNT	CONTRACTOR(AIRFRAME)	CONTRACTOR(ENGINE)
*MSDF				
US-1	1	57	Shin Meiwa	IHI
TC-90s	2	7	Beech Aircraft/ C. Itoh Aviation	Pratt & Whitney Aircraft
KM-2s	3	4	FHI	Avco Lycoming/ C. Itoh Aviation
HSS-2Bs	8	204	MHI	IHI
S-61As	2	34	MHI	IHI
sub total:	16	305		
*ASDF				
F-1s	5	126	MHI	IHI
T-2s	11	238	MHI	IHI
T-3s	12	20	FHI	Avco Lycoming/ C. Itoh Aviation
C-1	1	47	KHI	MHI
V-107As	2	24	KHI	IHI
MU-2	1	5	MHI	AiResearch Aviation
E-2Cs	4	343	Grumman/US Navy	Detroit Diesel Allison
sub total:	36	802		
Total:	71	1,163		

*Army equipment

Unit: ¥1 million

ITEM	NUMBER	AMOUNT	CONTRACTOR
Model 64 rifles	5,500	743	Howa Industry Co.
Model 62 machine guns	94	152	Nittoku Metal Industry
Model 74 tanks	48	14,867	MHI
Model 73 APCs	6	532	MHI(4) and Komatsu Ltd.(2)
Model 75 self propelled howitzers	26	6,686	MHI and Japan Steel Works (guns only)
Model 64 81mm mortars	69	167	Howa Industry Co.

CSO: 4120

ECONOMIC

WHITE PAPER ISSUED ON LAND UTILIZATION

OW200204 Tokyo KYODO in English 0155 GMT 20 May 80

[Text] Tokyo May 20 KYODO--The government said Tuesday that there was a need to promote overall measures under existing laws to strengthen the surveillance structure to prevent sharp increase in land prices and assure stable supply of land for residential purposes.

The annual white paper on land utilization, reported to the regular cabinet meeting by Director General Kiyomitsu Sonoda of the National Land Agency, said the task facing the nation was to make efforts for redevelopment of major urban areas and for promotion of transformation of farmland in such urban areas into residential districts.

The white paper, the sixth in the annual series announced so far, said that wage-earners accounted for 65 per cent of those purchasing housing lots in the nation in 1979, occupying an overwhelming majority.

Of the land purchasers, those in their thirties accounted for 33 per cent of the total, those in their forties 29 per cent, and those in their fifties 21 per cent.

It said 26 per cent of the total had annual income averaging between yen 3 million and 4 million.

The area of land purchased for building houses averaged 212 square meters on a nationwide average.

There was a big gap, however, in the area and price of land purchased in the rural and urban areas, the white paper said.

The area of land purchased in the rural areas averaged 261 square meters and the price yen 4,830,000. This contrasted sharply with the average 147 square meters and yen 10,130,000 in the Tokyo areas.

The white paper said land prices in 1979 increased by an average of 10 per cent nationwide with prices of residential land rising 12.3 per cent over the previous year.

It did not expect land prices to increase drastically in the future, when regarded from an overall point of view.

But it said there was need to keep careful watch on price movements in the major urban areas, including Tokyo, where demand for residential land remains strong.

CSO: 4120

ECONOMIC

FOKKER, AIRBUS PROPOSE JOINT MARKET SURVEY WITH JAPAN

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 pp 2,3

[Text]

Eiichi Ohara, Chairman of the Society of Japanese Aerospace Companies (SJAC) and also Chairman of Fuji Heavy Industries Ltd. (FHI), told a press conference in Tokyo last week that Fokker Aircraft Co. and Airbus Industrie had respectively proposed for Japanese assistance in conducting preliminary joint market surveys and technical feasibility studies on new commercial aircraft programs for a period of about one year.

An SJAC mission headed by Ohara returned to Tokyo April 21 after a two-week fact-finding tour of European aircraft industries. Both Fokker and Airbus Industrie have been proposing to Japan joint development of a new generation passenger aircraft (coded in Japan as the Y-XX).

Fokker told the Japanese mission that it plans to make a decision on the 130-seat F29 program by the middle of 1981, based on the proposed joint market survey. Airbus Industrie also said that it wants to make a decision on its SA-1 and SA-2 programs around the middle of next year, according to Ohara.

Ohara told the press that it would be necessary for the Japanese industry to conduct its own preliminary study before deciding to join one of them for such a market survey and technical studies. If this is to be realized, the industry will ask the Japanese government for necessary funds.

Concerning a possibility of merging Fokker's F29 with Airbus Industrie's SA-1 and SA-2 programs, the mission received the impression that this would not happen in present circumstances, he said.

In addition to the proposals by Fokker and Airbus Industrie, Boeing has told Japan that . plans to promote studies on modification of its aircraft now in service or under development, which might meet Japan's future Y-XX requirements.

CSO: 4120

HITACHI SEIKI TO TAKE PART IN PROFILER MARKET

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 4

[Text]

Hitachi Seiki Co. has decided to enter the profiler market and established a project team in order to start selling machines in two or three years.

The five-man team will approach aircraft manufacturers on technology and marketability of profilers for machining aircraft parts. As to technology, it will first explore the possibility of modifying its current products. If modification turns out to be impossible, it will consider development of new techniques or introduction from foreign firms. The team will also study which aircraft engines and fuselages its profilers should be designed to machine.

Hitachi Seiki has been marketing mainly numerically-controlled lathes, machining centers and specialized machine tools. Its transfer machines, sold to such automakers as Isuzu Motors, Ltd. and Nissan Motor Co. account for 15 to 20 percent of its total sales.

Japanese machine tool producers place great expectations on the profiler market as American aircraft manufacturers are ordering profilers here to cover shortage in the US resulting from brisk production of military aircraft. Demand from Japanese aircraft manufacturers is also expected to increase because they will start producing F-15 fighters and parts for Boeing 767s.

Among machine tool makers, Toshiba Machine Co. has already started selling profilers and Osaka Kiko Co. inaugurated a project team last autumn to develop products for future marketing.

The Japanese machine tool industry, vulnerable to a recession, has been trying to diversify. The moves of Osaka Kiko and Hitachi Seiki are likely to encourage other machine tool manufacturers to enter the profiler market.

CSO: 4120

ECONOMIC

LINE-UP OF JAPANESE 767 SUBCONTRACTORS

Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 pp 3, 4

[Text]

Ten major Japanese manufacturers participating in the Boeing 767 production program, other than Yokohama Rubber Co., are listed below:

Teijin Seiki---The company was awarded a ¥3,000 million contract to supply power-controlled actuators in February 1979, for 200 aircraft plus a further 100 aircraft on option. In April 1980 examples for rig tests were delivered to Boeing. Delivery of production type actuators is scheduled to begin in September 1980. Teijin also has orders for yaw damper servo and aileron lockput actuators. In November 1979, it also contracted to supply parts for 300 Boeing 737 aircraft.

Shimadzu Seisakusho---During February through March 1979, the company received a series of orders worth ¥900 million to supply 1) angle gearboxes; 2) power-drive unit gearboxes for flaps; 3) isolation bypass valves for engine thrust reversers; 4) lateral trim actuators; 5) power-drive unit gearboxes 6) isolation hydraulic valve modules for flaps; and 7) cargo door power control units. Orders received by Shimadzu and other companies are for 200 aircraft plus a further 100 on option as was the case with Teijin. Delivery is the same as that of Teijin.

Mitsubishi Heavy Industries (Daiko Plant)---Received an order for supply of sequence valves for hydraulic locking units for the main landing gear.

MELCO---An order was received for supply of fuel valves for engines and auxiliary power units (APUs).

Kawasaki Heavy Industries Akashi Plant---Awarded an order to supply angle gearbox assemblies for flap power control units.

New Japan Aircraft Maintenance---Won an international tender for supply of lavatory modules worth ¥5,000 million. The company has been supplying galley units for Boeing jetliners for the past ten years.

Kayaba Industry---During July through December 1979, the company received orders to supply various types of hydraulic equipment worth ¥1,000 million. These include 1) brake metering valves; 2) nose gear selector valves; 3) main gear side-brake actuators; 4) main gear drag-brake actuators; 5) nose gear lock actuators; 6) main gear lock actuators; and 7) nose gear retracting actuators.

Sumitomo Precision Products---The company received a $540,000 order from Menasco, its licensor, for processing of steering collars and four other items for nose gears. Delivery will be made from August 1980 through July 1981 for 69 aircraft.

Koito Manufacturing Co.---The company is to supply 90 reading light units worth ¥300 million. Delivery will begin in October 1981. It also received an order to supply exit sign lights.

Matsushita Electric Industry---Received an order to supply passenger entertainment systems.

CSO: 4120

HELICOPTER PROCUREMENT PLANS FOR GENERAL AVIATION

Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 p 1

[Text]

More medium helicopters for cargo transport duties will be procured by civil operators during FY 1980. Procurement plans by company follow:

Asahi Helicopter: One Bell 206. (The company took delivery of three Mil 8 helicopters from the Soviet Union in March for local assembly)

Nakanihon Air Service: One Bell 206B. (The company recently took delivery of two Bell 212s)

Shin-Nihon Helicopter: One Hughes 500 and one Bell 214.

Air Lift: One Kawasaki-Vertol KV 107 II.

Toho Air Service: One Aerospatiale AS350 and one SA330 Puma.

Nihon Norin Helicopter: One Hughes 500D and one Bell 204B-2.

Osaka Airways: Two Bell 206L-1s.

Shin-Nihon Kokunai Koku: One AS350 and one BK117.

Imperial Air Lines: One twin-engine and one medium helicopter.

Kagoshima Kokusai Koku: One Bell 206B (on lease)

Nihon Helicopter: One Bell 47G4-A.

Shikoku Koku: One medium helicopter.

As to future equipment, Sikorsky S-76s, Bell 222s, SA332 Super Pumas, SA365N Dauphin 2s, AS355E Ecureuil 2s, and Boeing-Vertol Chinooks are being considered by various operators.

CSO: 4120

ECONOMIC

FOKKER REITERATES HOPES FOR JAPANESE JOINING F29 PROJECT

Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 pp 1,2

[Text]

In its latest effort to induce Japanese firms to participate in the F29 jetliner joint development project, H. F. Swarttouw, Chairman of Fokker Aircraft Co., visited MITI April 24, together with Dr. H. Leliveld, Director-General for Industry, Dutch Ministry of Economics. Swarttouw and the Dutch official met Shohei Kurihara, Director of Machinery and Information Industries Bureau, and Noboru Hatakeyama, Director of Aircraft and Weapons Section, MITI.

Dr. Leliveld stated that the Dutch government has three basic policies covering its industries, 1) fostering wholesome industries, 2) fostering highly technically-advanced and unique industries, and 3) encouraging international collaboration. He emphasized that the aircraft industry receives strong support from the Dutch government in this respect.

Swarttouw, then, reiterated his desire for Japanese participation in the F29 joint development project. The Japanese officials, sources report, however, withheld any commitment. Kurihara is said to have told the Dutch visitors that MITI would like to reach a decision at an early date after discussions at the Aircraft and Machinery Industry Council, an advisory body to MITI.

A report from the SJAC mission to Europe is in the making and the council plans to hold a meeting of its Policies Subcommittee in mid-May to study government policies for FY 1981 and beyond, based on the findings of the SJAC mission.

MITI has been pursuing policies to promote the Japanese aircraft industry, including the Y-XX project for development of a 130-150 passenger twinjet airliner, through international collaboration. In addition to the F29 proposal, other aircraft manufacturers including Airbus Industrie, Dassault-Breguet, and Boeing have shown interest in a joint project with the Japanese.

CSO: 4120

YOKOHAMA RUBBER RECEIVES BOEING ORDER FOR 757 PARTS

Tokyo JPE AVIATION REPORT-WEEKLY in English 14 May 80 pp 2, 3

[Text]

Yokohama Rubber Co. has received an order from Boeing Commercial Airplane Co. for lavatory modules and water tanks for 300 Boeing 757 medium-range airliners. A contract on the order worth more than ¥3,000 million was signed at the US company on April 21 between E.V. Fenn, Vice President of Boeing, and H. Ishikawa, General Manager of the Japanese firm's Aviation Division.

This is Boeing's first direct order placed with Yokohama Rubber. Indirectly, Yokohama Rubber obtained an order for main wing fairings for Boeing 767s from Fuji Heavy Industries.

A 757 aircraft has four lavatory modules and one water tank. Yokohama Rubber's lavatory modules are made from honeycomb structure of a heat resistant material developed by Du Pont. They are light and highly resistant to impacts and heat. The water tank is made from a composite material consisting of the honeycomb structure and fiber glass.

The lavatory modules and water tanks will be delivered to Boeing from next year to around July 1985.

Yokohama Rubber is Japan's biggest maker of various light aircraft parts, including fuel tanks, tires, metalic parts and aluminum honeycomb. It has been developing light composite materials for aircraft in view of advancing aircraft technology. Although the latest order from Boeing will not immediately lead to expansion of firm's aircraft parts division, it points out its technology and quality control.

CSO: 4120

ECONOMIC

ORDERS, OPTIONS PLACED FOR 100 BK-117 HELICOPTERS

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 pp 3,4

[Text]

Kawasaki Heavy Industries Ltd. (KHI) and West Germany's MBB have received orders and options for about 100 of the BK-117 multipurpose twin-turbine helicopters now under joint development since they started promoting sales in January 1979, according to KHI.

The active orders demonstrate a successful start of their joint project for development and production of the eight-to-12-seat medium-size helicopter.

Of the total, MBB has received orders for about 80 units bound for Europe and the United States. The remaining orders obtained by KHI comprise about 10 from the Japanese private sector and as many from Australia.

They have set a sales target of about 500 units for five years from FY 1981 starting in April 1981. MBB will account for about 350 units of the target and KHI for about 150. A target for 10 years from the same year is 800 to 1,000 units.

KHI hopes to sell about 50 units of its share to the Japanese private sector and foreign countries and about 150 to the Defense Agency and other government agencies. It places great expectation especially on possible large orders from the Defense Agency.

The Japanese and West German firms launched the BK-117 project in February 1977. They have already fabricated four prototypes, which are now undergoing flight, ground and fatigue tests. The BK-117 is scheduled to be certificated for VFR by the aviation authorities of both Japan and West

Germany by the end of this year. American and British certificates will be obtained in March 1981. IFR certification is expected to be issued by the end of 1981.

The two companies started quantity production of the helicopters in April after designing was completed in March. The already-ordered helicopters will be delivered from September 1981 to the first half of 1983.

CSO: 4120

FIRST BOARD MEETING OF RR/JAPAN JOINT ENGINE VENTURE HELD

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 5

[Text]

An Anglo-Japanese company formed to develop a new jet engine for future 120-150 seat airliners has been formally inaugurated and held its first board meeting in Derby, England last week.

Equity in the company, named Rolls-Royce and Japanese Aero Engines Limited, is held fifty-fifty by Rolls-Royce and a group of three Japanese companies - Ishikawajima-Harima Heavy Industries (IHI), Kawasaki Heavy Industries (KHI) and Mitsubishi Heavy Industries (MHI).

There are five Japanese and five Rolls-Royce directors and at the board meeting Ashley Raeburn, a Vice Chairman of Rolls-Royce was elected Chairman.

Japanese and Rolls-Royce personnel are working together in offices near the British company's plant at Bristol to complete the detail design of the engine which will produce 20,000 lb thrust and has been designated the RJ500.

The first stage of the development, the detail design and initial launch of the engine with aircraft manufacturers and operators, has been underway for several months and is fully funded. Also defined in this stage will be the extent of the work needed to complete full development of the engine up to the point of delivery to customers.

The first stage also includes efforts to win firm commitments to the engine from one or more aircraft manufacturers. Discussions are taking place with several companies for this purpose.

Directors of Rolls-Royce and Japanese Aero Engines Limited are: Osamu Nagano and Kaneichiro Imai of IHI, Hiroharu Tsukamoto of KHI, Kenji Ikeda of MHI, Kozo Hirata who is Managing Director of the Society of Japanese Aerospace Companies, and from Rolls-Royce A.R.G. Raeburn, A.D. Jackson, P.F. MacFarlane, A.G. Newton and R.H. Robins.

CSO: 4120

F-15 AND P-3C ENGINES FOR SUBSTANTIATION TESTS IN FALL

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 pp 5,6

[Text]

The Pratt & Whitney F100-PW-100 turbofan for the ASDF F-15 fighter and the Allison T56 turboprop for the MSDF P-3C antisubmarine patrol aircraft will undergo substantiation tests this fall, incorporating locally-made parts. The first F100 engine imported from the US has entered calibration tests while the first imported T56 turboprop will begin test runs for calibration purposes in May at IHI's Mizuho Plant. These engines will be modified to incorporate local parts, upon completion of calibration tests. Through 150-hour substantiation tests, local parts will be tested if they will meet qualifications for use with production engines.

For the first production lot, the engines are planned to contain 50 percent locally-made and the other 50 percent being imported parts. For the F100 about 1,500 items will be locally manufactured, while the T56 will use about 800 items of local manufacture. It is scheduled, however, that about 200 items each will be tested with both engines this fall.

CSO: 4120

ECONOMIC

FUJITSU TO ASSEMBLE FIRST TSC FOR MSDF P-3C

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 6

[Text]

Fujitsu in late March was awarded a ¥2,014 million contract by the MSDF to assemble the first tactical support center (TSC) for the MSDF/Lockheed P-3C antisubmarine patrol aircraft. The center will be constructed at the MSDF Atsugi Air Station by the end of March 1982.

Major elements of the TSC such as the central computer unit (CPU), the directional frequency analysis and recording (DIFAR) system, data recorder, and part of the VH/HF communications system were to be imported through the foreign military sales (FMS) contracts concluded in FY 1979, worth about ¥370 million. Other components will be imported on a commercial basis by Fujitsu.

The first TSC for the MSDF P-3C aircraft thus will comprise major components imported from the US. Fujitsu will be responsible for assembling and integrating these components and systems. The Japanese company will be assisted by SDC and Tracor, US companies which are contracted by the US Navy for maintenance of TSCs for the USN Orions. The MSDF TSC, however, will be different from the USN system in areas of software in order to satisfy Japanese requirements.

While Fujitsu will mainly work on the automatic data processor (ADP) and the system integration, it will subcontract work on subsystems. NEC will work on acoustic analysis systems, while Toshiba will be responsible for display and control units. Hitachi will work on communications subsystems.

For future TSCs, plans for local manufacture of major components are being studied.

CSO: 4120

BRIEFS

FUTURE TRADE STRATEGY--Tokyo May 20 KYODO--Japan should avoid trade friction with other countries and become a mature creditor nation, the Japan Foreign Trade Council said Tuesday. In its report on future trade and industrial strategy, the organization of 13 major general trading houses called on Japanese firms to enhance an early shift to technology intensive and high added value industries. At the same time, Japan should promote exports of plants and technology involving less trade friction with other countries, thus becoming a mature creditor nation--meaning that profit should be gained through capital exports rather than through exports of goods, the council said. Economic interdependence is expected to grow further in future with expansion of world trade, but problems like the current Japan-U.S. auto trade dispute will probably increase, becoming a major headache for Japan, which depends so heavily on trade, it said. The report also pointed out that it has become important for Japanese firms to study the possibility of an international division of labor, by using, for example, auto parts made in countries to which Japanese cars are exported. [Text] [OW200334 Tokyo KYODO in English 0244 GMT 20 May 80]

CSO: 4120

ACCELERATED PROMOTION STRATEGY FOR MAIN LINE PROJECTS

Tokyo DENRYOKU SHIMPO in Japanese Nov 1979 pp 71-76

[Article by Masami Yamanaka: "Contents and Aims of Accelerated LNG and Geothermal Projects"]

Development of Coal Liquefaction

1) Status of Technological Development

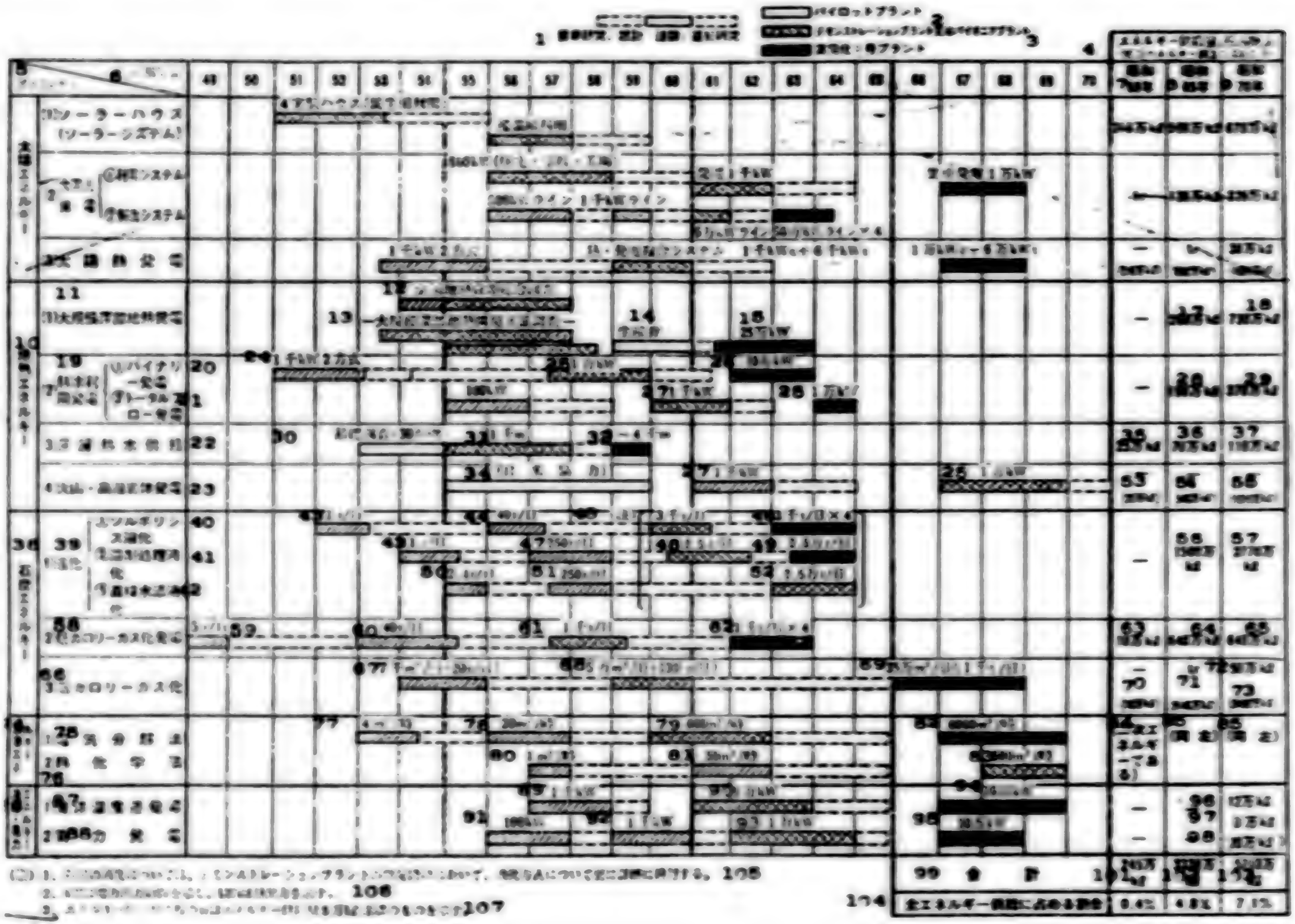
i) Developments on the following three methods are being promoted in the Sunshine Project

a) Dissolution of coal under atmospheric pressure in asphalt for solvolysis liquefaction which is a method developed solely in Japan, b) dissolution of coal under medium pressure in a portion of liquefied oil while conducting the liquefaction by the solvent extraction liquefaction method, and c) liquefaction of coal under high pressure by hydrogeneration decomposition. The general features of these three methods are listed in Table 4.

ii) Basic research on mechanism of liquefaction, effect of catalyst, and conditions conducive to promotion of the liquefaction reaction along with research on element technology of reaction vessels and solid-liquid separation facilities to date have been successful in elucidating the conditions for the liquefaction reaction. At the same time, engineering subjects relative to plant development have been clarified. In one of these methods (solvolysis method) the above results are the basis for operational research on a 1 t/day bench scale coal treatment plant being conducted at the present time.

The construction or design of 1-2 t/day class bench scale plants is under way on the other two methods. These plant developments will be promoted, and the results obtained will be used to scale up the design to large type plants which are expected to produce large quantity of low cost oil in a production technology whose establishment on a practical scale as quickly as possible is the primary subject.

Table 2. Accelerated Promotion Plan



Key to Table 2.

1. element research, design, construction, operation research
2. pilot plant
3. demonstration plant and pioneering plant, practical plant No 1
4. energy supplied (oil equivalent (Overall Energy Survey Group, Demand and Supply Section)
5. project
6. JFY (Showa)
7. 1985
8. 1990
9. 1995
10. geothermal energy
11. large scale deep geothermal power generation
12. comprehensive all country geothermal sources survey
13. large scale deep geothermal development demonstration survey
14. production well
15. 250,000 kW
16. [no entry]
17. 2.8 million kL
18. 7.3 million kL
19. hot water utilization power generation
20. binary power generation
21. total flow power generation
22. deep layer hot water supply
23. volcanic and hot rock power generation
24. 1,000 kW, type 2
25. 10,000 kW
26. 100,000 kW
27. 1,000 kW
28. 1.9 million kL
29. 3.7 million kL
30. basic survey (30 sites)
31. 1,000 m
32. 4,000 m
33. [no entry]
34. Japanese-American cooperative effort
35. 250,000 kL
36. 700,000 kL
37. 1.1 million kL
38. coal energy
39. liquefaction
40. solvolysis liquefaction
41. solvent treatment liquefaction
42. direct water addition liquefaction
43. 1 t/day
44. 40 t/day
45. (Note) 3,000 t/day
46. 3,000 t/day x 4
47. 250 t/day
48. 2.5 t/day
49. 25,000 t/day
50. 2.4 t/day
51. 250 t/day
52. 25,000 t/day
53. 250,000 kL
54. 5.4 million kL
55. 12.1 million kL
56. 15 million kL
57. 27.7 million kL
58. low calorie gasification
59. 5 t/day
60. 40 t/day
61. 1,000 t/day
62. 1,000 t/day x 4
63. 100,000 kL
64. 6.4 million kL
65. 6.4 million kL
66. high calorie gasification
67. 7,000 m^3/day
68. 50,000 m^3/day
69. 350,000 m^3/day
70. 100,000 kL
71. 21.4 million kL
72. 500,000 kL
73. 34.6 million kL
74. hydrogen energy
75. electrolysis method
76. thermolysis method
77. 4 m^3/hr
78. 20 m^3/hr
79. 600 m^3/hr
80. 1 m^3/hr
81. 50 m^3/hr
82. 6,000 m^3/hr

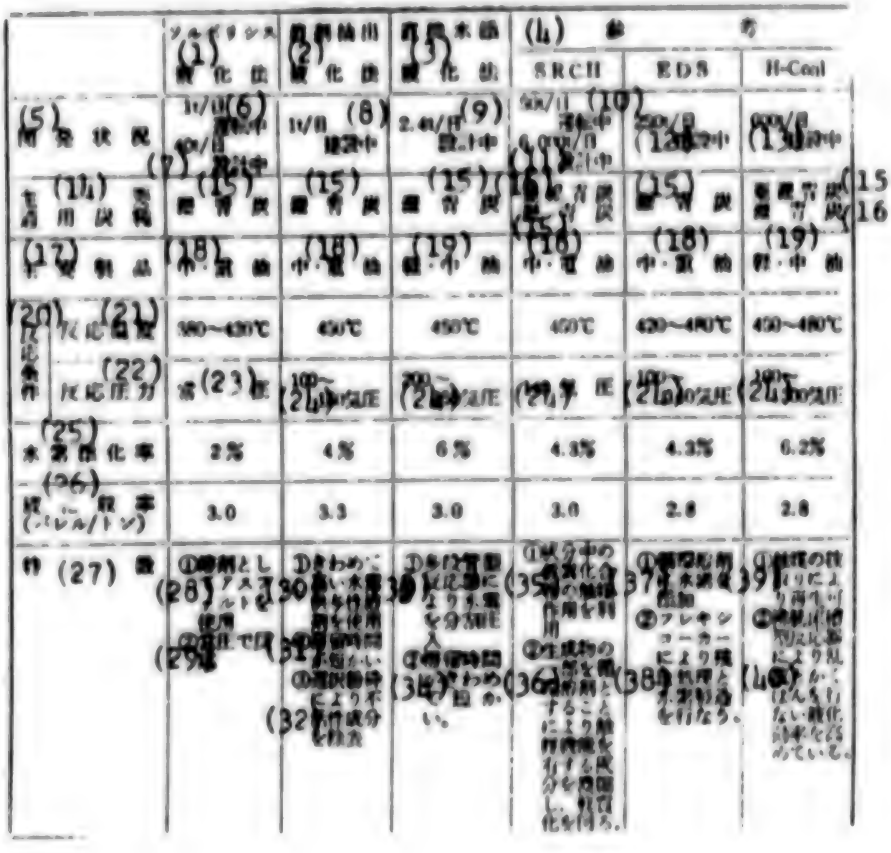
83.	500 m^3/hr	94.	100,000 kW
84.	is secondary energy	95.	100,000 kW
85.	same as left	96.	120,000 kL
86.	marine, wind energy	97.	80,000 kW
87.	sea water temperature differential power generation	98.	200,000 kL
88.	wind power generation	99.	total
89.	1,000 kW	100.	[no entry]
90.	10,000 kW	101.	2.45 million kL
91.	100 kW	102.	33.3 million kL
92.	1,000 kW	103.	57.1 million kL
93.	10,000 kW	104.	fraction of total energy supply

105. (Note) 1. more detailed studies in liquefaction method at the demonstration plant development stage for the liquefaction of coal

106. 2. KW represents electrical power ouput kWe, and kWt represents thermal output

107. 3. tr in the column on amount of energy supplied in quantity less than 50,000 kL

Table 4. Comparison of Coal Liquefaction Processes



	(1)	(2)	(3)	(4) SRC II	EDS	H-Coal
(5)	1t/日 (6) (7)	1t/日 (8)	2.4t/日 (9)	(10) (11)	(12)	(13)
(14)	(15)	(15)	(15)	(16) (15)	(15)	(15) (16)
(17)	(18)	(18)	(19)	(18)	(18)	(19)
(20) (21)	380~420℃	450℃	450℃	460℃	430~480℃	430~480℃
(22)	(23)	(24)	(24)	(24)	(24)	(24)
(25)	2%	4%	6%	4.3%	4.3%	6.2%
(26)	3.0	3.3	3.0	3.0	2.8	2.8
(27)	(28) (29)	(30) (31) (32)	(33) (34)	(35) (36)	(37) (38)	(39) (40)

Key to Table 4:

1. solvolysis liquefaction method
2. solvent extraction liquefaction method
3. direct water addition liquefaction method
4. reference
5. development status
6. 1 t/day, in operation
7. 40 t/day, under design
8. 1 t/day, under construction
9. 2.4 t/day, in design stage
10. 50 t/day, in operation
11. 6,000 5/day, in design stage
12. 250 t/day, under construction
13. 600 t/day, under construction
14. main type of coal used
15. bituminous coal
16. subbituminous coal
17. principal products
18. medium, heavy oil
19. light, medium oil
20. reaction conditions
21. reaction temperature
22. reaction pressure
23. atmospheric pressure
24. --atmospheres
25. hydrogen addition rate
26. liquefaction rate (barrels/ton)
27. features
28. asphalt used as solvent
29. reaction at atmospheric pressure
30. solvent with very high contributory rate of hydrogen used
31. short time of residence
32. inert components removed by selective crushing
33. hydrogen is added in several steps using multistage tube type reaction vessel
34. residence time is extremely short
35. utilize catalytic effect of iron compounds in the ash
36. use of portion of product as solvent concentrates ash with catalytic effect and enables production of lighter product
37. hydrogen added to circulating solvent
38. flexicoker used for residue treatment and hydrogen production
39. catalyst removed for regeneration
40. boiling bed tank type reaction vessel used to stir and create turbulent flow and thereby enhance liquefaction efficiency

2) Directions in Technological Development

i) The primary direction of coal liquefaction technology in Japan's energy strategy is aimed at "domestic production of energy." To this end there is need to plan development of liquefaction technology which will fit in with the energy resources situation unique in Japan.

ii) In order to develop liquefaction technology quickly in this direction, there is need to a) promote independent technological development and b) plan international joint development in project participation with leading foreign countries.

Development of independent technology is expected to establish technology that will enable independent control in line with Japan's national situation. In another direction, joint international development is designed to disperse the risk associated with technological development. At the same time, it is expected that the technology for coal liquefaction obtained by joint development will be the basis for early realization of practical coal liquefaction. Furthermore, this international joint research will be a means to absorb and learn engineering technology of the leading countries, and this acquisition will be effective in hastening independent technological development as well as in raising efficiency.

iii) Based on the viewpoints described above, Japan is engaged in independent technology development in the form of the Sunshine Plan and, at the same time, is engaged in joint development with the United States on SRC II and EDS.

Where liquefaction technology for the Sunshine Plan is concerned, (イ) Japan's coal liquefaction program has many phases which are destined for foreign siting, and the transport of liquefied products has to be considered and a) raise the liquefied fraction yield (liquefaction yield) (the gaseous fraction cannot be brought to Japan) and b) pursue reduction in cost even more than the other countries (there is need to cover the fraction of costs due to transport).

ロ) taking into account Japan has less margin for securing the coal to be used for liquefaction compared to other countries, liquefaction technology will be developed which can process available coal from a very wide range of coal varieties from various sources.

These directions are aimed at the development of independent technology that fits in with the resources and energy situation unique in Japan. Since the present status is the stage of development in which 1-2 t/day small scale plants are under study, future plans must be directed at large plants and the tackling of engineering subjects, and their efficient solution are musts. On the other hand, where SRC-II and EDS are concerned, early construction of large plants are being eyed, and the application of oil refining technology to coal liquefaction is targeted. Until all these are accomplished, there will be a void in the applicability to the resources and energy conditions unique to Japan. Since these plans are already at the stage of development of large plants of the 250 t/day to 6,000 t/day class, there is already considerable accumulation of engineering technology related to large plants.

Consequently, it will be vital from here on to plan even more cooperation on both projects while striving for the early and efficient achievement of liquefaction technology development intrinsic to Japan based on independent technology.

3) Subjects and Developmental Targets Directed at Practicalization

i) The presently operating or under construction plants of 1-2 t/day scale will be the sites for the following studies which are expected to be completed by the middle of the 1975 decade. イ) Shape of reaction vessel, ロ) solid-liquid separation method, ハ)efficiency of catalyst and solvent, ニ) continuous liquefaction conditions. These technological subjects will be eludicated, and the technological feasibility of the liquefaction process will be established. (For example, where the solvolysis process is concerned, 70 hours continuous operation of the 1 t/day plant was achieved in JFY 1978, and a 200-hour test is planned for JFY 1979. A 0.1 t/day small continuous liquefaction plant was completed at the end of JFY 1978 for the direct water addition liquefaction method, and this facility is now being used to conduct continuous liquefaction runs.)

ii) Pilot plants of the 40-250 t/day class are being constructed for operation in the latter half of the 1975 decade, and technological subjects along the lines of reaction vessel, pumps, and other principal equipment and material development are being resolved. The engineering efforts are targeted for large volume, low cost, and continuous liquid oil production through a large plant. In addition, the solution of engineering subjects related to scale-up to a practical scale plant and the understanding of design conditions will be earnestly sought.

In this case, イ) where the 40 t/day class small pilot plant is concerned, attention is being directed at establishing the technological feasibility of a plant constructed mainly of ordered parts. This will be the stepping stone in the scale-up up to several thousand t/day demonstration plant where the engineering technology involved in the scale-up will be tested and demonstrated (multistep approach).

ロ) In another direction, where the 250 t/day class pilot plants is concerned, every effort will be made to use already present parts for its assembly. Engineering problems associated with scale-up to a practical scale plant will be resolved, handle will be obtained on design conditions, and these will be tied into the development of the next phase pioneering plant of 20,000 plus t/day class (prototype of the full size practical facility) (leap frog approach).

iii) The results of ii) will be the basis for more specific technological evaluation of these different methods by the end of the 1975 decade. At the same time, detailed evaluation will be conducted on the economies, suitable coal types, and product makeup while the supply conditions of coal from other countries and the demand picture for oil and oil products in Japan will be taken into consideration while planning specific developmental industrial setup and establishing siting points. In the meantime, construction of several thousand to 20,000 plus t/day class demonstration plant or pioneering plant will be pushed, and the developmental possibilities of an integrated liquefaction suitable for practical application will be demonstrated.

イ) Economic Prospects

According to the economic evaluation of the practical demonstration plants for SRC II and EDS (30,000 t/day and 25,000 t/day respectively), the cost of producing liquefied coal is estimated at 20-2 plus dollars/barrel using present prices (the price of the coal used is 15 to 20 plus dollars/ton) (construction costs are estimated at about 20,000 dollars/barrel/day). The above technological development is also the basis for the liquefaction mode by the Sunshine Plan, and the production costs come out at almost the same level. If this economic target is to be realized, the abovementioned technological development must enable development of economic plants and improved production efficiency (the production of 3 to 3.3 barrels of oil per ton of coal is the goal). At the same time, the assurance of general use coal for liquefaction that will be discussed later will be a prime subject.

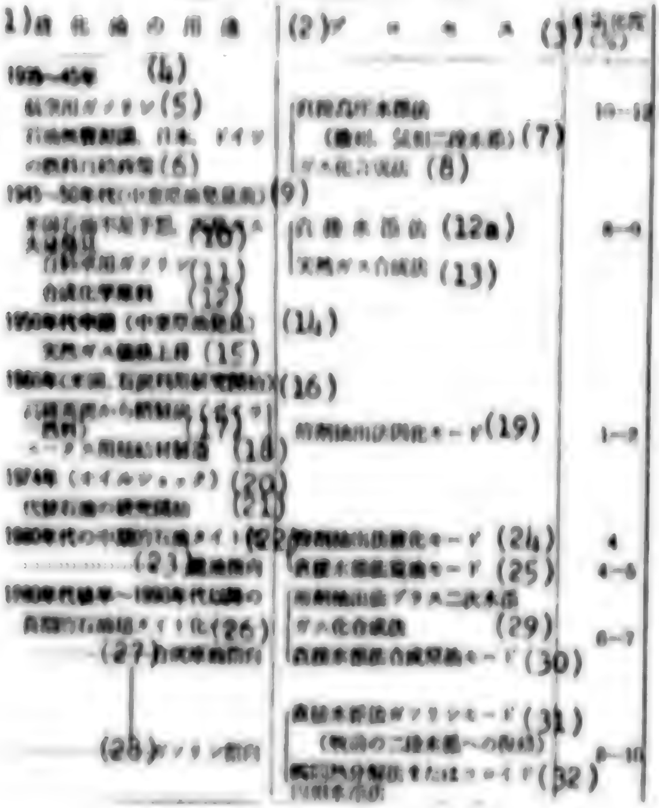
ロ) Suitable types of coal and product makeup

The main types of coal usable for the different liquefaction methods are listed in Table 5. The Sunshine Plan plans the production of medium-heavy oil and light-heavy oil starting mainly from bituminous coal, but it is also said to be studying the utilization of lignite from the marshes of Australia and other countries. In addition, there is need for further studies on hydrogen addition balance from the standpoint of product makeup to enable utilization of liquefied oil in a wide range of applications.

ハ) Assurance of supply of overseas general use coal for liquefaction and siting points

Some overseas sources of general purpose coal which come to mind include Australia, Canada, China, United States and India, but these source countries tend to look toward processing the coal at home to increase its value before the export. This point has to be taken into consideration, and future development of general purpose coal will involve construction of liquefaction plants at the source of the coal as the direction to be taken. There is urgent need for assuring sources of general use coal in other countries together with sitings for these liquefaction plants.

Table 5. History of Coal Liquefaction--Trends in Liquefied Product Makeup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(31)
(32)
10–12
8–9
1–2
4
4–6
6–7
8–10

Key:

1. use of liquefied oil
2. process
3. degree of hydrogenation (percent)
4. 1935-45
5. airplane gasoline
6. self fuel supply policy of gasoline poor countries such as Japan and Germany
7. direct high pressure hydrogenation method (liquid phase, gas phase 2-stage addition)
8. gasification synthetic method
9. 1945-50 (before discovery of oil in the Middle East)
10. oil shortage predicted for the United States, discovery of large gas fields
11. gasoline for automobiles
12. synthetic chemistry raw material

12a. direct water addition

13. natural gas synthesis method
14. middle 1950's (discovery of Middle East oilfields)
15. natural gas price rises
16. 1960 (coal utilization research started in the United States)

[continuation of Key to Table 5]

17. purified coal from high sulfur yellow coal (boiler fuel)
18. production of binder for coke production
19. solvent extraction method solidification mode
20. 1974 (oil shock)
21. research on oil substitute initiated
22. oil becomes tight during the middle 1980's
23. trend to heavy oil
24. solvent extraction liquefaction mode
25. direct water addition heavy oil mode
26. oil becomes very tight during latter half of 1980's and after 1990
27. trend to synthetic crude oil
28. trend to gasoline
29. solvent extraction method plus secondary water addition gasification synthetic method
30. direct water addition synthetic crude oil mode
31. direct water addition gasoline mode (return to prewar 2-stage water addition)
32. instantaneous thermolysis of colloid solid phase water addition method

At the present time, there is a strong request by the Australian Government for talks on one phase of Japanese-Australian cooperative efforts in the form of utilization of the lignite found in Victoria Province (known economically recoverable reserves of 35 billion tons) for liquefaction purpose, and it is expected that a response to this request will be one step toward the assurance of acquisition of general use coal from overseas source and siting points.

a) Provision of developmental industrial system

At the present pilot plant to demonstration plant development stage, it is vital that the establishment of a vigorous research and development promotion mother body be planned to tie together the research and developmental capabilities of industry, government, and academic circles to be used for the early development of large-scale liquefaction technology which will be smoothly moved into the practical stage. At this time, particularly in the post demonstration plant development stage a most important problem is to take into account not only the engineering industry but product makeup as well while tying together the energy demand and supply industries and setting up a comprehensive developmental industrial system to be directed toward early practicalization.

(Note) The Japan Coal Liquefaction Technology Development Company which is a private industry participating in the Japanese-American EDS coal liquefaction project has capital contributions from oil, electric power, automobile, and trade industries.

iv) Based on the results of the projects described above, plans will be laid for the development of about three sites located overseas with total treatment capacity of 90,000 t/day (about 295 barrels/day of liquefied oil) by 1990 (at this time the annual energy supply is expected to be 15 million kiloliters when converted to oil, and the consumption of general use coal is expected to be about 29 million tons).

v) Furthermore, plans will be drawn for the development of new plants in addition to the above which will enable the treatment of at least 165,000 t/day coal (530,000 barrels/day oil equivalent) by 1995 (at this time the total annual energy supply is expected to be 27.7 million barrels oil equivalent or consumption of 54 million tons general use coal).

(Note) The figures given above are for the amounts Japan will handle and import. When a joint venture with a local industry is to be promoted, naturally there is need to consider production on a scale larger than that given below (Fig 1).

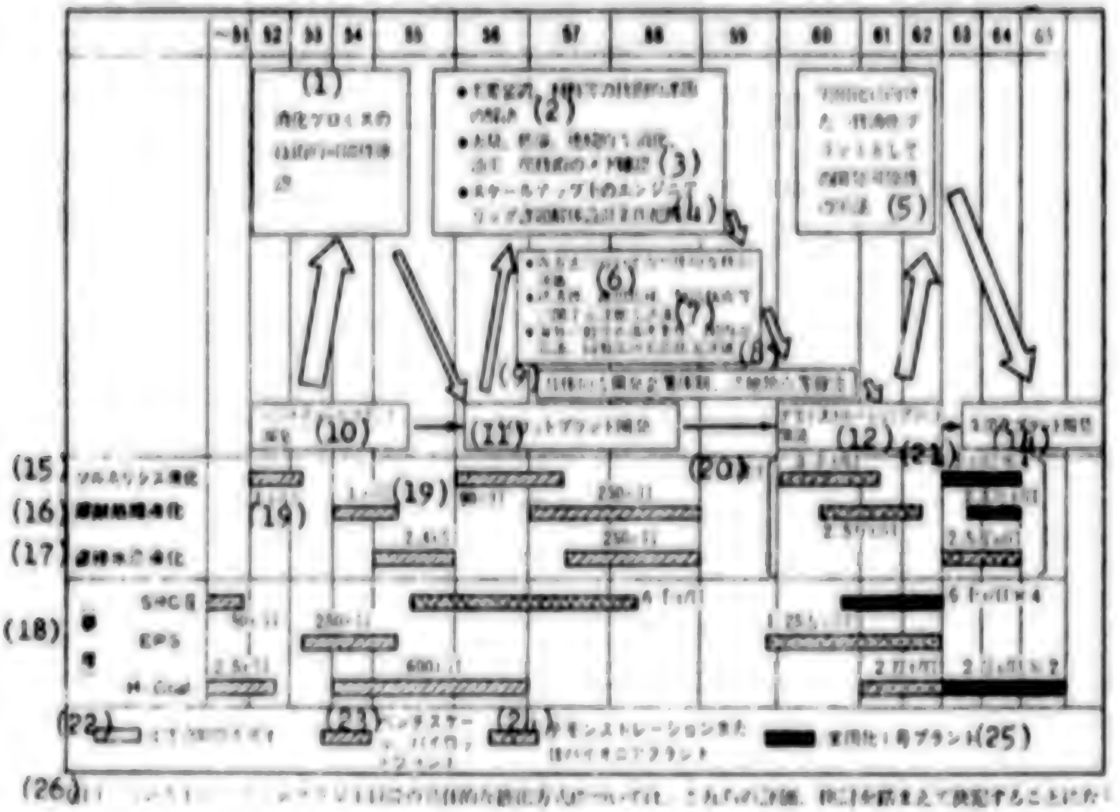

Figure 1. Steps in Coal Liquefaction Development

Key to Fig 1:

1. recognition of technological feasibility of the liquefaction process
2. resolution of technological subjects such as principal equipment and materials
3. establishment of goals for large volume, low cost, and continuous liquefaction and oil production technology
4. acquiring design conditions related to engineering subjects on scale-up
5. demonstration of developmental possibility of integrated plant for practical scale
6. specific technological evaluation of different methods
7. detailed evaluation of the economics, suitable coal types, and product makeup
8. evaluation of foreign coal supply situation, domestic oil situation, and domestic demand situation
9. specific developmental industrial system, siting points establishment
10. bench scale plant development
11. pilot plant development
12. demonstration plant development
13. [no entry]
14. industrial plant development
15. solvolysis liquefaction
16. solvent treatment liquefaction
17. direct water addition liquefaction
18. (reference)
19. - t/day
20. (Note)-thousand t/day
21. - x 10^4 t/day
22. denotes construction period
23. bench scale, pilot plant
24. demonstration or pioneering plant
25. practical plant No 1
26. (Note) these evaluations and studies will be the basis of specific liquefaction methods for after the demonstration plant

2. Development of Large Scale Deep Geothermal Power Production

1) Status of Technological Development

i) There are presently geothermal power plants operating in 6 sites throughout Japan with total production of 168,000 kW, but these all use steam from the comparatively shallow depths of 1-2 thousand meters, and the maximum output for any given site is 50,000 kW.

ii) In contrast to the above, deep geothermal source power generation utilizing steam from 3-4 thousand meter depths is expected to be able to tap much more vast reserves, and the maximum production of 150-250 thousand kW per site can be expected. There is already in the United States the development of geothermal power plants producing about 620-000 kW (maximum scale of 2.4 million kW anticipated) from the superior geothermal belt close to San Francisco where geothermal heat is being extracted from roughly 3,000 meters in depth.

iii) There is need for early establishment of environmental protection technology and early development of search and drilling technology to promote development of large scale deep geothermal sources. The Sunshine Plan undertook this technological development in 1974, and the following is the status of this program.

イ) Search technology

There are geothermal reservoirs at roughly 1,500 meters underground, and search technology applicable to geothermal sources which have very visible surface signs has been developed to a considerable degree. Present efforts are being directed at early establishment of search technology for even deeper geothermal sources.

ロ) Drilling technology

In order to drill for deep geothermal heat at depths of 3-4 thousand meters, drilling technology has to be developed capable of operating at 350°C high temperature conditions (these are the temperature conditions found in Japan at depths of 3-4 thousand meters). At the present time, technology for drilling at temperature of 250-300°C has just about been established (this is usually equivalent to the temperature at 1,500-2,000 meters underground), and the stage has been attained, and there is good possibility that technology for operating at 350°C will also be realized.

ハ) Environmental protection technology

This technology is essential to geothermal development regardless of whether shallow or deep geothermal sources are involved. At the present time, the technology to remove arsenic is essentially perfected, and there is promise that technology for production at depths of 1,500-2,000 meters, underground water accompanying reduction, mechanism of effects to the foundation, removal of hydrogen sulfide, and prevention of scale formation (impurities present in geothermal hot water such as silica and calcium carbonate) will be soon established.

iv) Along the lines of large scale deep geothermal steam and hot water utilization, steam power generation using just the steam has already been developed. Power generation using the hot water which accompanies the steam already has been demonstrated feasible through a 1,000 kW class pilot plant, but there is need for effort to establish technology to improve the utilization efficiency and the economic factors.

2) Subjects Directed at Practicalization and Developmental Targets

i) In order to promote development of large-scale deep geothermal heat, the geothermal reserves situation in the geothermal belts throughout the country need to be made clear, the promising geothermal reserve sites should be pinpointed, and the probability of geothermal drilling and development needs to be greatly increased. The establishment of the prospecting and drilling technology to realize this end is the number one problem.

ii) With this in mind, prospecting and drilling technology to make possible large-scale deep geothermal development will be established quickly along the following lines.

イ) Prospecting technology

The results of research and development on methods for the total understanding of the three elements which make up geothermal sources; a) heat storage layer structure, b) morphology of water movement, and c) heat source; will be the basis for promoting demonstration surveys such as borings, and prospecting technology will be established which will enable accurate drilling and development of geothermal sources which underlie the entire country at a depth of 4,000 meters.

At the same time, leading comprehensive technology will be exercised to conduct surveys of the geothermal belts of the entire country, and macro understanding of the reserves situation of the deep geothermal sources over the entire country will be attained.

[illegible])Drilling technology

Developments will be promoted on a) bits (cutting edge of drill) and b) muddy water for drilling use (used to cool the bit and remove drill shavings) to enable drillings under the high temperature conditions of 350°C. At the same time, layer inspection equipment will be developed in order to study the situation at the depth at which drilling was made, and economic and efficient drilling technology which can withstand the high temperature conditions at 3,000-4,000 meter depths will be established aimed for attainment by the middle of the 1970 decade.

iii) There need be no further amplification but that the establishment of such prospecting and drilling technology will cause spectacular advances in large-scale deep geothermal development, accurate and efficient borings will become possible, and the total number of actual borings can be reduced. As a result, a) the range of effect to the environment by these borings can be reduced. At the same time, it can be expected that geothermal developments outside of national parks where there are no surface signs of underground geothermal sources will be possible; b) As the result of reduced number of borings, great reduction in developmental costs should result because of which conditions will be established which will greatly abet the conditions which make possible efficient geothermal development.

iv) As a result, the establishment of the technology to make possible development of large-scale deep geothermal sources of the type described before will serve as the basis for the industrialist to provide the following conditions for the promotion of full scale development of large-scale deep geothermal sources. Full scale development of large-scale geothermal power generation of the 150-250 thousand kW class over the entire country by about the latter half of the 1970 decade will be promoted, and up to 10 or more power plants for the production of a total of 1.5 million kW from these large scale deep geothermal sources by 1990 will be planned (in this case the effective utilization of the hot water which accompanies the steam will also be promoted. Should a binary system for power production become possible, another 500,000 kW can be generated).

イ) **Reducing** development risk and protecting the economic aspects

As discussed before, promoting development through the exploitation of the high level of prospecting technology which has been developed will enable large reduction of production cost, and it is estimated that a 250,000 kW class power plant will be able to produce power (at generator site) at 11 yen/kW hr by 1978 prices. Furthermore, the development risk will be lowered through subsidies, low interest loans, and loan guarantees.

ロ) Harmony with the environment

The effects on the environment accompanying the developments will be lowered through the adoption of high level prospecting technology as was mentioned before. At the same time, development of areas outside the confines of the natural parks can be anticipated. On the other hand, there is still need to promote overall harmony between geothermal development and environmental protection.

v) Promotion of development will be pushed still further, and there are plans for large-scale deep geothermal power plants producing about 4 million kW at a total of 20 or more sites which are expected to be on stream by 1995 (if binary power production is included here, an additional 1.5 million kW can be produced).

2267
CSO: 8129/1103

FEASIBILITY OF HYDROELECTRIC POWER REVIEWED

OW190131 Tokyo KYODO in English 0125 GMT 19 May 80

[Text] Tokyo May 19 KYODO--In the midst of increasing uncertainty over international oil supplies, and calls to develop domestic energy resources such as thermal and water power, the Ministry of Construction is to consider incorporating hydroelectric power plants in dam construction sites.

Ministry officials recently announced a scheme to review the construction plans of 248 multi-purpose dams, now under construction, which do not already incorporate proposals for hydroelectric power facilities.

The aim of the review is to identify dams suitable for hydroelectric power generation and then approach the Ministry of International Trade and Industry (MITI) and electric power companies to establish generating facilities there.

In dams where the cost would not be too great, the ministry also plans to install small-scale generators to supply the power needs of the dam itself.

The review will take into account such factors as the potential hydroelectric output of each dam, the height of the water head and the cost of incorporating generating facilities.

Some of the dams under consideration range in water storage capacity from 30 to 100 million tons. The list includes the Kawaji dam on the Tone River in Tochigi Prefecture, the Mikunigawa dam in Niigata, and the Yaei dam on the Kose River in Hiroshima Prefecture.

Because of the huge cost of installing hydroelectric power plants, at present rates the basic cost of the electricity generated would be yen 15-16 per kilowatt per hour, much higher than the yen 12 equivalent for electricity generated from burning oil.

However, the ministry estimates that in another fifteen years the cost of imported oil will have soared from the present dollar 30 or so per barrel to around dollar 50, bringing the cost of oil-generated electricity to around yen 18 per kilowatt per hour.

This would then make hydroelectricity a feasible proposition.

One problem is that the power companies base their assessment of costs on predictions roughly five years ahead, and may not be willing to invest now for a period fifteen years in the future.

However, ministry officials believe that with the stability of future oil supplies uncertain and because of strong public reservations about nuclear power generation, hydroelectricity is certain to come into focus as a clean domestic energy source in the future.

For this reason ministry officials say the groundwork for power generation at suitable dams should be laid, even if the power companies are not immediately prepared to develop power plants there.

"At least, as a first step, we must make sure there is a water chute for power generation when they are ready," said one official.

CSO: 4120

SCIENCE AND TECHNOLOGY

FUEL-EFFICIENT MITSUBISHI PLANE MAKES A CLEAN HIT

Tokyo KYODO in English (No time given) 14 May 80

[Text] Tokyo May 14 KYODO--The Mitsubishi MU-300 business aircraft is proving to be a hit, with foreign orders flowing in at a faster-than-anticipated pace.

Mitsubishi Heavy Industries Ltd. has received orders for 80 planes and the number appears certain to top 100 by the end of next month, a year after the company began marketing the aircraft.

Although Mitsubishi has not yet obtained type approval by the U.S. Federal Aviation Administration, company officials said American businessmen are showing a keen interest in the fuel-efficient plane.

The pace of orders outshines the Mitsubishi MU-2, the first Japanese-developed civil jet aircraft, which proved to be a boon to the company's aircraft business.

Orders for the MU-2 twin-turboprop utility transport have reached some 650 units since it went on sale a decade ago and new orders are now running at a monthly rate of six to seven.

The first delivery of the MU-300 is expected to be made early next year if everything goes well, the officials said.

The company is planning to seek type approval by the Transport Ministry's Civil Aviation Bureau so it can seek orders from the Defence Agency and Maritime Safety Agency, they said.

The dollar 2 million aircraft, powered by Pratt and Whitney JT15D-4 engines, is claimed to be able to cruise at the maximum speed of 805 kilometers per hour.

The company expects total sales in the first decade to come to some 1,000, mostly in the United States.

CSO: 4120

BRIEF RUNDOWN ON MISSILE DEVELOPMENT PROGRAMS

Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 pp 6-8

[Text]

Some of the major development programs of the Japanese Defense Agency's Technical Research & Development Institute (TR&DI) on various guided missiles follow: -

XSSM-2---Development began in FY 1979 to meet a requirement from the Ground Self-Defense Force (GSDF). Although details are classified, it is said to be a long-range antiship missile. It will be launched from inland bases against hostile ships in coastal waters.

Basically a variant of the ASM-1 air-to-ship missile for use with the ASDF F-1 support fighter, the XSSM-2 will be powered by a jet engine instead of the rocket motor for longer range. During FYs 1979 through 1980, work on the XSSM-2 will cover systems study and prototype development of the engine and a new control system.

This is the first time the Japanese will develop a jet engine to power a missile. Mitsubishi Heavy Industries Ltd. (MHI) is responsible for development of the low-cost expendable engine.

The control system for the XSSM-2 will be of the digital type instead of the analog system of the ASM-1. It will control position as well as attitude. Also position data will be preprogrammed. The missile will use an inertial guidance system, checking its position through the control system.

Further study on the XSSM-2 will cover a launching booster unit.

Chu-MAT---This is intended to replace the Model 64 MAT now in service with the GSDF. The program, which began in FY 1978, is presently in the advanced stage after fabrication and testing of a number of prototype homing heads and laser designators. During FY 1980, an optimum guidance system will be selected and be followed by fabrication of full-scale missile systems.

The Chu-MAT semiactive antitank missile will home on targets which are illuminated by laser. A tactical advantage of this laser homing system is that the launcher and the laser designator can be deployed at separate positions.

Air Combat AAM---One of TR&DI's in-house programs called "Theme Study," development of the new infrared homing air-to-air missile began in FY 1975. It is intended to develop a highly maneuverable missile for "dog fighting" air combat roles. The program covers development of a new homing head that will enable the missile to attack targets from side or front as well as from behind. To obtain better maneuverability, study on new control surfaces and their configurations is being pursued.

Man-portable SAM---This is also a "Theme Study" of the TR&DI. Development began in FY 1979 to obtain a man-portable surface-to-air missile that will home on the target through an image homing system. This is the first time that a SAM using the image homing system has entered development studies. SAMs now in service or under development throughout the world are fitted with either infrared or radar homing systems.

Performance of the infrared system is usually limited to tracking the target, while that of the radar homing system is vulnerable to electronic countermeasures.

The image homing system is expected to overcome these defects. With use of the CCD (image sensing elements), the projected homing head seeks out the target as a whole rather than the heat source. This enables the missile to carry out frontal attacks.

In FY 1979, the TR&DI fabricated two different homing heads having CCD elements. Experimental propelling units, wind tunnel models of the missile, and testing devices were also fabricated. Further work will concentrate on determining the optimum number of the CCD elements to obtain highest possible resolving power for the homing head to detect small targets.

The propelling system comprises two stages ---the first stage is for firing and the second for "cruising."

CSO: 4120

SCIENCE AND TECHNOLOGY

TR&DI PLANS DEVELOPMENT OF TAN-SAM II

Tokyo JPN AVIATION REPORT-WEEKLY in English 30 Apr 80 p 9

[Text]

In response to a request from the GSDF, the TR&DI plans to start in FY 1981 development of the Tan-SAM II advanced surface-to-air missile. The Tan-SAM II is intended as a successor to the Tan-SAM, the first Japanese short-range SAM that was adopted by the GSDF in FY 1979. The GSDF however wants to develop more advanced SAMs well in advance to meet air threats of the future.

At this early planning stage, details of the Tan-SAM II are unknown. It is probable, however, that it will have all-weather capability and will be able to attack various targets. The guidance system will have better electronic counter countermeasure (ECCM) performance and more sensitive infrared sensing devices.

The GSDF has been promoting modernization programs for air defense weapons systems. During the FY '78 MTDP covering FYs 1980-84, it will deploy the Tan-SAM to protect air space not covered by the Hawk SAM and the L-90 35mm AA gun systems, along with man-portable SAMs. Four of the 8.5 Hawk battalions will also be reequipped during the same period with an advanced SAM such as the US Army SAM-D Patriot. Full-scale procurement is planned to start in FY 1981 for both the Tan-SAM and the shoulder-launched SAM.

Under the circumstances, it is still uncertain whether the Tan-SAM II development plan will be authorized to start in FY 1981 or not.

CSO: 4120

TR&DI PUSHES MT-X DEVELOPMENT PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 pp 8, 9

[Text]

The Technical Research & Development Institute (TR&DI), JDA, is finalizing programs for FY 1981; the MT-X program to develop the next intermediate trainer of the ASDF is included in the four new programs of 80 R&D projects which will be requested for funding in FY 1981.

The TR&DI will finalize the MT-X program during April-May for authorization as a long-term project starting in FY 1981. It is pointed out by observers that the MT-X program is not included in the FY '78 Medium-Term Defense Program covering FYs 1980-84, since full-scale production is scheduled beyond FY 1985. This means that the MT-X program must first be examined as one of development programs of the TR&DI rather than an ASDF project.

The MT-X program is also linked with the FY '81 MTDP covering FYs 1983-87. In any event, the TR&DI plans to start the project in FY 1981 as a long-term program.

The TR&DI started a development program in FY 1980 for a small turbofan engine for use with the MT-X, reflecting policies of the ASDF to locally develop a new trainer and its engine.

Intended to replace T-33A and T-1A/B trainers, the ASDF is said to require about 200 MT-X trainers over the coming 10 years.

CSO: 4120

AUTOPILOT FOR F-1 WANTED QUICKLY

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 8

[Text]

The ASDF and the TR&DI plan to continue development of an autopilot system for the ASDF F-1 support fighter during FY 1980. About ¥700 million is said to be authorized in the FY 1980 defense budget. A request for a similar amount was not authorized for FY 1979.

The autopilot system is being requested by pilots of the F-1 squadrons to lessen work loads and thus enable them to concentrate on detecting targets and operation of other equipment after reaching an assigned area.

ASDF fighters such as the F-104J, F-4EJ, and F-15 are all equipped with autopilot systems. The reason for the lack of this system in the F-1 is that it was developed from the T-2 advanced trainer.

With service introduction of the ASM-1 air-to-ship missile during FY 1980, F-1 pilots are calling for early completion of the autopilot system. Sources predict the system will not become operational at least until FY 1983.

CSO: 4120

JAPANESE ELECTRONIC EQUIPMENT FOR F-15

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 7

[Text]

The ASDF and the TR&DI are developing two types of electronic equipment for installation on the ASDF F-15 fighter. The XJ/APR-4 warning radar is scheduled for in-flight tests in the latter half of FY 1980, following completion of prototypes. If the airborne tests are successful, it will be adopted as a standard equipment in FY 1982. Tokyo Keiki is involved in development of this radar system which started in FY 1976.

The XJ/ALQ-8 ECM training system will be fabricated in FY 1980 at an authorized fund of ¥1,000 million. Since the amount was reduced from the originally requested ¥1,300 million, the balance will be requested in FY 1981.

Started in FY 1979, the XJ/ALQ-8 program calls for an ECM training unit that can be installed on some of the ASDF F-15s. Unlike similar systems which are installed in external pods as with ASDF F-104J and F-4EJ fighters, the XJ/ALQ-8 will be accommodated in the fuselage. It is then expected that service introduction of the XJ/ALQ-8 will be a few years behind the XJ/APR-4 system.

CSO: 4120

NISSAN MOTOR DEVELOPS BINDER FOR ROCKET PROPELLANT

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 pp 9, 10

[Text]

Nissan Motor Co. has developed a hydroxyl terminal polybutadiene (HTPB) polymer as a binder or a key material for solid rocket propellants jointly with Japan Synthetic Rubber Co. This will pave the way for Japan's use of purely-domestic propellants, providing major contributions to the advancement of its space exploration technology.

The company plans to make an experimental HTPB propellant for the final booster of a large rocket at Nippon Oils & Fats Co. from this summer.

HTPB is a binder polymer of polybutadiene mixed with hydroxyl. It can be produced at less cost than the carboxyl terminal polybutadiene (CTPB) polymer which has so far widely been used for solid rocket propellant. The HTPB polymer can upgrade propellants because its capability of binding solid fuels and oxidants is superior to that of CTPB types. Although foreign nations have tried to develop the HTPB polymer, it has so far been used mostly for military missiles in the United States.

In Japan, Tokyo University's Institute of Space and Aeronautical Science has so far used imported CTPB polymer for its rocket propellant, and the National Space Development Agency (NASDA) HTPB polymer purchased from the United States. However, imported HTPB polymer is inferior to that used for missiles in the United States and it is uncertain whether a stable supply from that country can be secured. This has prompted Japan to develop the HTPB polymer on its own at a time when its utilization of space exploration technology is growing.

Nissan Motor and Japan Synthetic Rubber started joint research into HTPB rocket propellants in 1978 and succeeded in turning out 400 grams at a laboratory at the end of the year. Later, they made three 50-kilogram solid propellant units at a pilot plant. Based on these achievements, Nippon Oils & Fats will first produce a one-ton HTPB propellant unit and then a two-ton unit for practical use.

CSO: 4120

6-HOUR OPERATION TEST CONDUCTED FOR XF-3 ENGINE

Tokyo JPE AVIATION REPORT-WEEKLY in English 30 Apr 80 p 8

[Text]

The 3rd R&D Center of the TR&DI recently conducted a six-hour operational test with the second prototype of the XF-3 fan jet engine, which succeeded in producing a maximum thrust of 1,660 kilograms in the middle of last December. The test engine is one of the five engines for pre-flight rating tests (PFRT) to be procured under the FY 1980 (April 1980-March 1981) budget.

The six-hour operational test was part of the preparations for PFRT under which each engine will be operated for 60 hours in 10 six-hour increments.

The second test engine will undergo about 100 hours of distortion, acceleration and other tests in FY 1980 to upgrade durability and reliability of the XF-3 engine.

The TR&DI will receive the five PFRT engines in FY 1981 and five more in FY 1982 to end PFRT by FY 1983. It plans to finish all other tests, including flight tests on the C-1 testbed and high altitude tests at American facilities as well as ground running tests, by the end of FY 1985.

CSO: 4120

BRIEFS

'BIOMASS RESOURCES' INTO METHANE--Tokyo May 15 KYODO--Seaweeds are a promising substitute for oil through biomass utilization, according to a research report announced Thursday by the Science and Technology Agency's National Institute of Resources. The report explained possibilities of utilization of biomass resources and technical matters for putting the resources into practical use. Biomass resources, including terrestrial and aquatic plants and vegetable wastes such as wheat straw, have the advantage of being renewable and inexhaustible sources of energy. The report said seaweeds, as biomass resources, have very promising production capacity. "Makonbu" (tangle) will yield 65 to 700 tons per one hectare and methane fermentation of the tangle is expected to produce 1,100 to 11,800 cubic meters of methane (equivalent to one to 11 kiloliters of oil), the report said. Chlorella, for example, will also yield 30 to 150 tons per one hectare and its production of methane is estimated at 5,600 to 28,000 cubic meters (equivalent to five to 27 kiloliters of oil). The report also said one of the bottlenecks in utilization of biomass resources is the need of energy to convert methane and alcohol into fuel. Thus, the report also cited blue coral and eucalypti, which will produce hydrocarbons like oil, as promising biomass resources. While saying biomass resources are effective when used in combination with other natural fuels, the report pointed out the need of technical development such as improvement in yields and in conversion efficiency into fuel for practical use. [Text] [Tokyo KYODO in English (no time given) 15 May 80]

PROGRAM FOR AW-X--The TR&DI in FY 1980 will modify a Model 61 tank to use with the Oerlikon 35mm antiaircraft machine gun system to develop a prototype of the AW-X on request from the GSDF. Development of a new self-propelled antiaircraft gun system began in FY 1978 with import of a set of the Oerlikon weapon. During FY 1979 a fire control system was developed. Modification of a Model 61 tank to carry the machine gun system will continue into FY 1981. The GSDF plans to evaluate the AW-X for service introduction in or around FY 1987 but it is not certain whether the chassis of the Model 61 tank or that of the Model 74 tank will be adopted for series production of the AW-X. The GSDF is promoting a program to develop a new main battle tank for planned adoption in 1988. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 7 May 80 p 8]

CSO: 4120

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24 June 1980

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